

subcl/

(a) introducing at least a first etchant into the chamber wherein the first etchant is selected to minimize deposition of a material on the internal surfaces; and

(b) striking a plasma in the chamber to cause disassociation of the first etchant wherein the disassociated first etchant comprises a first recombination rate with the material substantially different than a second recombination rate with the internal surfaces.

B1

2. (Amended) The method of claim 1, wherein a deposition rate at which the material is formed on the internal surfaces is less than about 30 Å/min.

cont

3. (Amended) The method of claim 1, further comprising:

(c) cleaning the internal surfaces prior to (a).

subcl/

4. (Amended) The method of claim 1, wherein the first etchant comprises Chlorine, Hydrogen chloride, and combinations thereof.

5. The method of claim 4, further comprising:

(c) etching one or more layers from a substrate comprising silicon.

6. (Amended) A method of etching a substrate in a chamber having internal surfaces, comprising:

(a) flowing at least a first etchant and a second etchant into the chamber, wherein a volumetric flow of the first etchant is greater than a volumetric flow of the second etchant; and

subcl/

(b) striking a plasma in the chamber to cause disassociation of the first etchant and the second etchant, wherein the disassociated first etchant deposits material on the internal surfaces at a first rate and the disassociated second etchant deposits material on the internal surfaces at a second rate less than the first rate.

7. (Amended) The method of claim 6, wherein the first etchant comprises Chlorine, hydrogen chloride, and combinations thereof.

503 8. (Amended) The method of claim 6, wherein the second etchant comprises bromine, Hydrogen Bromide, and combinations thereof.

9. (Amended) The method of claim 6, wherein the first etchant comprises chlorine and the second etchant comprises bromine.

B1
cut 10. The method of claim 6, further comprising:

(c) etching one or more layers from the substrate, wherein the one or more layers comprise silicon.

11. (Amended) The method of claim 6, further comprising cleaning the internal surfaces prior to (a).

B2 12. (Amended) A method of etching a substrate in a chamber having internal surfaces, comprising:

(a) flowing at least a first etchant and a second etchant into the chamber, wherein a volumetric flow of the first etchant is greater than a volumetric flow of the second etchant;

537 (b) striking a plasma in the chamber to cause disassociation of the first etchant and the second etchant, wherein the disassociated first etchant deposits material on the internal surfaces at a first rate and the disassociated second etchant deposits material on the internal surfaces at a second rate less than the first rate; and

(c) flowing oxygen into the chamber.

13. (Amended) The method of claim 12, wherein the first etchant comprises chlorine and the second etchant comprises bromine.

B3 18. (Amended) A method of etching a substrate, comprising:

(a) positioning a substrate in a chamber having internal surfaces;

(b) flowing a chemical mixture into the chamber;

(c) striking a plasma of the chemical mixture to form one or more plasma constituents,

(d) depositing a film on the internal surfaces; wherein a first recombination rate of the one or more plasma constituents with the internal surfaces is substantially equal to a second recombination rate of the one or more plasma constituents with the film; and

(e) etching the substrate.

19. (Amended) A method of etching a substrate, comprising:

(a) positioning a substrate in a chamber having internal surfaces;

(b) flowing a chemical mixture into the chamber;

(c) striking a plasma in the chamber from the chemical mixture to form one or more plasma constituents,

(d) depositing a film on the internal surfaces, wherein a first recombination rate of the one or more plasma constituents with the internal surfaces is substantially equal to a second recombination rate of the one or more plasma constituents with the film; and

(e) etching the substrate, wherein the substrate comprises polysilicon and wherein the internal surfaces substantially comprises quartz.

20. (Amended) The method of claim 19, wherein the internal surfaces comprise liner disposed on a chamber body.

21. (Amended) A method of etching a substrate, comprising:

(a) inserting a substrate into a chamber;

(b) flowing a chemical mixture into a chamber, the chemical mixture comprising:

(i) one or more of a bromine-containing fluid and a chlorine-containing fluid; and

(ii) a fluorine-containing fluid;

wherein a volumetric flow of the one or more of the bromine-containing fluid and the chlorine-containing fluid is at least 50% of the chemical mixture;

- B3
cut
- (c) striking a plasma; and
 - (d) etching the substrate.

22. The method of claim 21, wherein the fluorine-containing fluid comprises one or more of SF_6 , NF_3 and any combination thereof and wherein a volumetric flow of the fluorine-containing fluid is less than about 20% of the chemical mixture.

23. The method of claim 21, wherein fluorine-containing fluid comprises CF_4 and O_2 and wherein a volumetric flow of the fluorine-containing fluid is less than about 50% and a volumetric flow ratio of CF_4 to O_2 is about 4:1.

24. The method of claim 21, wherein the fluorine-containing fluid comprises one or more of CF_4 and a volumetric flow of CF_4 is less than 50% of the chemical mixture.

25. The method of claim 21, wherein the bromine-containing fluid comprises hydrogen bromide and the chlorine-containing fluid comprises hydrogen chloride.

B4

26. (Amended) The method of claim 21, wherein etching the substrate comprises etching one or more layers from the substrate, wherein the one or more layers comprise silicon.

27. (Canceled) An apparatus for etching a substrate, comprising:

- (a) a process chamber including a chamber body having an internal surface, ;
- (b) one or more sources of one or more etchants coupled to the process chamber; and
- (c) at least one plasma generator disposed adjacent the process chamber for striking a plasma in the process chamber by disassociating the one or more etchants, wherein a first reaction rate of the disassociated one or more etchants with the internal

surface is substantially the same as a second reaction rate of the disassociated one or more etchants with a material formed on the internal surface during processing.

28. (Canceled) The apparatus of claim 27, wherein the substrate comprises polysilicon and wherein the internal surface substantially comprises quartz.

29. (Canceled) The apparatus of claim 27, wherein the internal surface comprises a liner disposed on the chamber body.

Please add the following claims:

30. (New) An apparatus for plasma processing a substrate, comprising:

(a) a processing chamber comprising a body having a cavity therein;

(b) internal surfaces disposed within the cavity;

(c) at least one source of etchants coupled to the cavity that are dissociated during substrate plasma processing into at least one disassociated etchant; and

85 (d) a material on the internal surfaces formed by a first reaction between the at least one disassociated etchant wherein the first reaction comprises a first reaction rate substantially different from a second reaction rate of a second reaction between the at least one disassociated etchant and the interior surfaces. ?

31. (New) The apparatus of claim 30, wherein the substrate comprises polysilicon and wherein the internal surfaces substantially comprise quartz.

32. (New) The apparatus of claim 30, wherein the internal surfaces comprise a liner disposed on the chamber body.

33. (New) The method of claim 19, wherein the one or more plasma constituents comprises Chlorine, Hydrogen Chloride, and combinations thereof.

Sub 34. (New) The method of claim 19, wherein the one or more plasma constituents comprises Bromine, Hydrogen Bromide, and combinations thereof.